CUSTOM INSTRUMENTATION
SERVICES CORPORATION

SOLVAY SODA ASH JOINT VENTURE
GREEN RIVER, WYOMING

UNIT 1 CALCINER
FLUE GAS ANALYZER SYSTEM

CERTIFICATION TEST REPORT

PREPARED FOR:
SOLVAY CHEMICALS, INC.

PREPARED BY:
CUSTOM INSTRUMENTATION SERVICES CORPORATION

REV. 0 COPY NO _____
DATE: January 12, 2007

7325 SOUTH REVERE PARKWAY • CENTENNIAL, COLORADO 80112
TEL: (303) 790-1000 FAX (303) 790-7292

TABLE OF CONTENTS

1. INTRODUCTION

Solvay Chemicals, Inc. owns and operates Solvay Soda Ash Joint Venture Plant, a sodium carbonate manufacturing facility located in Green River, Wyoming. The facility consists of two-stoker coal fired (originally a gas fired site) Calciners with one shared common stack. The Calciners use Selective Non-Catalytic Reduction (SNCR), Flue Gas Recirculation (FGR) and water injection to control NO_x formation. Emissions from the stack are monitored by a dedicated, certified continuous monitoring system (CMS). The CMS for purpose of this protocol includes both the continuous emissions rate monitoring system (CERMS) and the continuous opacity monitoring system (COMS). Emissions from each Calciner are monitored by a dedicated flue gas analyzer system (FGAS). The CMS and FGAS units are located at the base of the stack. Exhaust gases from all units are discharged into the atmosphere through a common stack approximately 110 feet above grade. This report contains information regarding the Calciner FGAS Unit 1, both FGAS Unit 2 and the common stack CMS have been submitted earlier under separate cover.

Custom Instrumentation Services Corporation of Centennial, Colorado built both the FGAS and CMS required per Federal and State regulations. This report provides information on the certification of the equipment measuring emissions from the Unit 1 Calciner. Data from the FGAS is recorded and stored on a Data Acquisition System.

The FGAS on the Calciner has been designed to meet the monitoring and reporting requirements of the State of Wyoming Department of Environmental Quality (WDEQ) and USEPA as required by 40 CFR 60. This report presents the results of testing on the oxides of nitrogen (NO_x), oxygen (O_2), and stack flow analyzers on the unit 1 Calciner. The testing was performed to meet the requirements of 40 CFR 60, Appendix B, Performance Specifications 2, 3, 6.

Field certification testing on the FGAS occurred between November 6, 2006 and December 6, 2006. These dates are consistent with the initial notification of the Solvay Soda Ash Joint Venture Certification Protocol. The tests conducted on the Unit 1 FGAS included Relative Accuracy, Linearity, and Calibration Drift test.

Optimal Air Testing Services, Inc. of Casper, Wyoming conducted the Relative Accuracy Test Audit (RATA) for NO_x, O_2 and flow. A minimum of nine 21-minute runs was completed on the Calciner. The results of the RATA tests are in the Optimal test portion, located in Appendix 1 of this report. As shown, the measured Relative Accuracy of each analyzer was within the EPA and WDEQ requirements for all parameters. A detailed description of the RA testing is provided in Section 2.1 and the Optimal test report in Appendix 1.

The calibration drift tests occurred during 7 consecutive operating days, which is consistent with WDEQ and federal accepted criteria. These tests took place between November 6, 2006 and November 12, 2006. The results of the analyzer drift tests are summarized in Table 1 and 2. As shown, the analyzers operated well within the applicable

EPA requirements. An explanation of the drift test is provided in Section 2.2 and supporting documentation is provided in Appendix 2.

Linearity tests on the NO_x and O_2 analyzers are a requirement of the WDEQ. 40 CFR 75 criteria were employed to meet this requirement. These tests took place on December 6, 2006. 40 CFR 75 Appendix A 6.2 allows the exemption of the low NO_x range linearity. The results of the tests are summarized in Table 1. As shown, the analyzers operated well within EPA requirements for all parameters. An explanation of the linearity test is provided in Section 2.3. Audit reports for the linearity tests are provided in Appendix 3.

Formula verifications were performed on the Data Acquisition and Handling System (DAHS) for the Calciner on December 6, 2006. The DAHS passed all the tests required by EPA. The DAHS tests are described in Section 3 and supporting documents are provided in Appendix 4.

In summary, the FGAS on Unit 1 Calciner at the Solvay Soda Ash Joint Venture Site provides reliable data and operates within the requirements of the EPA as outlined in 40 CFR 60, Appendix B, Performance Specifications 2, 3, 6 and the requirements of the WDEQ for the FGAS unit.

Table 1
SOLVAY SODA ASH JOINT VENTURE UNIT 1 CALCINER
SUMMARY OF FGAS CERTIFICATION RESULTS

UNIT 1 CALCINER	RESULTS	STANDARD	PASS / FAIL
RELATIVE ACCURACY			
NO_x ppm	6.93% RA	20% RA Reference Method	PASS
NO_x lb/MMBtu	3.56% RA	20% RA Reference Method	PASS
O_2%, dry vol.	0.25% RA	1.00% RA	PASS
7-DAY CALIBRATION DRIFT			
NO_x (Zero) 40 CFR 60	0.36% of span	2.5% of span	PASS
NO_x (Span) 40 CFR 60	1.52% of span	2.5% of span	PASS
O_2 % (Zero) 40 CFR 60	0.1%	0.5% O_2	PASS
O_2 % (Span) 40 CFR 60	0.4%	0.5% O_2	PASS
Stack Flow (Zero) 40 CFR 60	0.16% of span	3.0% of span	PASS
Stack Flow (Span) 40 CFR 60	0.37% of span	3.0% of span	PASS
LINEARITY			
NO_X	0.3% LE	5% LE	PASS
O_2 %, dry vol.	3.5% LE	5% LE	PASS
ANALYZER INFORMATION			
PARAMETER	**MODEL**	**SERIAL NUMBER**	
NO_x	CAI NOXygen 650	S07050	
$O_{2\text{-DRY}}$	CAI NOXygen 650	S07050	
Stack Flow	OSI OFS-2000	05090204E	

WHERE: MD* = RA RESULTS BASED ON AVERAGE MEAN DIFFERENCE OF FGAS AND REFERNCE METHOD
DRIFT AND LINEARITY RESULTS ARE THE HIGHEST ENCOUNTERED DURING ALL TESTS

2. CMS AND FGAS CERTIFICATION

Field tests and DAHS tests were performed for FGAS certification in accordance with the criteria in 40 CFR 60, Appendix B. The results for all tests were determined from the data collected by the DAHS. The computer printouts for each field test are included in the Appendices.

2.1 RELATIVE ACCURACY TEST AUDIT (RATA)

Relative accuracy test audits for the Unit 1 Calciner was performed between December 5-6, 2006. Each test run was a minimum of 21 minutes in duration and consisted of sampling for NO_x, O_2 and flow. The times during which the tests were performed are shown in the Optimal test report in Appendix 1.

The reference methods used by Optimal are outlined below:

CONSTITUENT	METHOD
Nitrogen Oxides (ppmdv)	EPA 7E
Nitrogen Oxides (lb/10^6Btu)	EPA 3A, 7E & 19
Oxygen (%, dv)	EPA 3A

As shown in the Relative Accuracy tables in the Optimal test report, relative accuracies for NO_x and O_2 are reported as a percent error and are the sum of the absolute mean value of the differences between the reference method tests and the instrument readings, plus the 95 percent confidence interval of the differences, expressed as a percentage of the mean reference method value. NO_x and flow results are acceptable if the relative accuracy using the reference method is less than or equal to 10 percent.

The analyzer response was determined from the average of readings taken every minute for the duration of the time the relative accuracy tests were performed. The raw value reports from the CMS and FGAS are included in the Optimal test report in Appendix 1.

The NO_x, O_2 and flow analyzers passed the relative accuracy requirements (as stated in 40 CFR 60, Appendix B, PS 2, 3 and 6.

2.2 CALIBRATION DRIFT TEST

The 7-day calibration drift on the NO_x, O_2 and flow analyzers occurred between November 6, 2006 and November 12, 2006 on seven consecutive operating days when the Unit 2 Calciner were combusting fuel at more than 50% of normal load.

The NO_x, O_2 and flow data from calibrations occurring over seven operating days are summarized in Appendix 2. As shown, the calibration error for all analyzers was well within EPA requirements. The calibration summary reports and certificates of analysis for the cylinders are provided in Appendices 2 and 5, respectively.

2.3 LINEARITY CHECK

The NO_x and O_2 linearity tests for the Unit 1 Calciner were performed on December 6, 2006. To perform the linearity test, the analyzers were challenged three times with each of three levels of calibration gas (low, mid and high). The mean difference between the analyzer response and the calibration gas value, as a percentage of the calibration gas value, must be within 5%. Results are also acceptable if the difference between the mean response and the calibration gas is within 5 ppm for NO_x or 0.5% O_2. The results for the analyzers on both units were within the requirements of WDEQ and 40 CFR 75 Appendix A.

Summaries of the linearity test results are provided in tables in Appendix 3. The calibration gases used for the linearity error tests were US EPA Protocol 1, following the requirements of 40 CFR 75, Appendix A. The certificates of analysis for the cylinders are included in Appendix 5.

3. FORMULA VERIFICATION

All variables included in the calculations were included. The formula verification spreadsheet and associated printouts are included in Appendix 4

4. DISCUSSION OF RESULTS

FGAS/DAS on Unit 1 Calciner at the Solvay Soda Ash Joint Venture Facility successfully met all the requirements of the EPA as outlined in 40 CFR 60.

APPENDIX 1

RELATIVE ACCURACY TEST AUDIT REPORT

APPENDIX 2

FGAS CALIBRATION DRIFT DOCUMENTATION

SOLVAY SODA ASH JOINT VENTURE
UNIT 1 CALCINER INITIAL CERTIFICATION

ANALYZER: *NOX* *SERIAL NO:* S07050
SPAN: 400
MODEL: CAI NOXygen 650
TYPE: Extractive/Chemiluminescent

ZERO CALIBRATION ERROR							
DAY	*DATE*	*HOUR*	*SPAN*	*REF VALUE*	*CEMS VALUE*	*DIFF*	*ERROR %*
1	11/6/2007	5:30	400.00	0.000	-1.375	1.375	0.34
2	11/7/2007	5:30	400.00	0.000	-1.450	1.450	0.36
3	11/8/2007	5:30	400.00	0.000	-1.334	1.334	0.33
4	11/9/2007	5:30	400.00	0.000	-1.331	1.331	0.33
5	11/10/2007	5:30	400.00	0.000	-1.288	1.288	0.32
6	11/11/2007	5:30	400.00	0.000	-1.432	1.432	0.36
7	11/12/2007	5:30	400.00	0.000	-1.418	1.418	0.35
						LIMIT	*2.5% OF SPAN*
						HIGH	**0.36**

SPAN CALIBRATION ERROR							
DAY	*DATE*	*HOUR*	*SPAN*	*REF VALUE*	*CEMS VALUE*	*DIFF*	*ERROR %*
1	11/6/2007	5:30	400.00	360.000	354.700	5.300	1.33
2	11/7/2007	5:30	400.00	360.000	364.979	4.979	1.24
3	11/8/2007	5:30	400.00	360.000	364.131	4.131	1.03
4	11/9/2007	5:30	400.00	360.000	362.428	2.428	0.61
5	11/10/2007	5:30	400.00	360.000	366.019	6.019	1.50
6	11/11/2007	5:30	400.00	360.000	366.099	6.099	1.52
7	11/12/2007	5:30	400.00	360.000	365.143	5.143	1.29
						LIMIT	*2.5% OF SPAN*
						HIGH	**1.52**

CALCULATIONS: ERROR = |R - A| / S

WHERE: R = REFERENCE VALUE (CALIBRATION GAS)
A = ACTUAL CEMS RESPONSE
S = ANALYZER SPAN

SOLVAY SODA ASH JOINT VENTURE

7-Day Drift Test

CA-1 NOx ppm

Time	Instrument Span	Zero Reference	Zero Measured	Zero Drift	Zero Drift Limit	Span Reference	Span Measured	Span Drift	Span Drift Limit	Status
11/06/06 05:30 AM	400	0.000	-1.375	-1.375	10.000	360.000	354.700	-5.300	10.000	On-Line
11/07/06 05:30 AM	400	0.000	-1.450	-1.450	10.000	360.000	364.979	4.979	10.000	On-Line
11/08/06 05:30 AM	400	0.000	-1.334	-1.334	10.000	360.000	364.131	4.131	10.000	On-Line
11/09/06 05:30 AM	400	0.000	-1.331	-1.331	10.000	360.000	362.428	2.428	10.000	On-Line
11/10/06 05:30 AM	400	0.000	-1.288	-1.288	10.000	360.000	366.019	6.019	10.000	On-Line
11/11/06 05:30 AM	400	0.000	-1.432	-1.432	10.000	360.000	366.099	6.099	10.000	On-Line
11/12/06 05:30 AM	400	0.000	-1.418	-1.418	10.000	360.000	365.143	5.143	10.000	On-Line

The 7-Day Drift Test has been passed.

SOLVAY2016_1.3_001706

SOLVAY SODA ASH JOINT VENTURE
UNIT 1 CALCINER INITIAL CERTIFICATION

ANALYZER:	***O2***	***SERIAL NO:***	S07050
SPAN:	25		
MODEL:	CAI NOXygen 650		
TYPE:	Extractive/Paramagnetic		

ZERO CALIBRATION ERROR							
DAY	*DATE*	*HOUR*	*SPAN*	*REF VALUE*	*CEMS VALUE*	*DIFF*	*RESULTS*
1	11/6/2007	5:30	25.00	2.530	2.645	0.115	0.1
2	11/7/2007	5:30	25.00	2.530	2.645	0.115	0.1
3	11/8/2007	5:30	25.00	2.530	2.611	0.081	0.1
4	11/9/2007	5:30	25.00	2.530	2.596	0.066	0.1
5	11/10/2007	5:30	25.00	2.530	2.642	0.112	0.1
6	11/11/2007	5:30	25.00	2.530	2.615	0.085	0.1
7	11/12/2007	5:30	25.00	2.530	2.628	0.098	0.1
						LIMIT	***0.5 % O2***
						HIGH	**0.1**

SPAN CALIBRATION ERROR							
DAY	*DATE*	*HOUR*	*SPAN*	*REF VALUE*	*CEMS VALUE*	*DIFF*	*RESULTS*
1	11/6/2007	5:30	25.00	20.900	21.280	0.380	0.4
2	11/7/2007	5:30	25.00	20.900	21.207	0.307	0.3
3	11/8/2007	5:30	25.00	20.900	20.991	0.091	0.1
4	11/9/2007	5:30	25.00	20.900	20.912	0.012	0.0
5	11/10/2007	5:30	25.00	20.900	21.209	0.309	0.3
6	11/11/2007	5:30	25.00	20.900	21.022	0.122	0.1
7	11/12/2007	5:30	25.00	20.900	21.044	0.144	0.1
						LIMIT	***0.5 % O2***
						HIGH	**0.4**

CALCULATIONS: ERROR = |R - A|

WHERE: R = REFERENCE VALUE (CALIBRATION GAS)
A = ACTUAL CEMS RESPONSE

SOLVAY SODA ASH JOINT VENTURE

7-Day Drift Test

CA-1 O2%

Time	Instrument Span	Zero Reference	Zero Measured	Zero Drift	Zero Drift Limit	Span Reference	Span Measured	Span Drift	Span Drift Limit	Status
11/06/06 05:30 AM	25	2.530	2.645	0.115	0.500	20.900	21.280	0.380	0.500	On-Line
11/07/06 05:30 AM	25	2.530	2.645	0.115	0.500	20.900	21.207	0.307	0.500	On-Line
11/08/06 05:30 AM	25	2.530	2.611	0.081	0.500	20.900	20.991	0.091	0.500	On-Line
11/09/06 05:30 AM	25	2.530	2.596	0.066	0.500	20.900	20.912	0.012	0.500	On-Line
11/10/06 05:30 AM	25	2.530	2.642	0.112	0.500	20.900	21.209	0.309	0.500	On-Line
11/11/06 05:30 AM	25	2.530	2.615	0.085	0.500	20.900	21.022	0.122	0.500	On-Line
11/12/06 05:30 AM	25	2.530	2.628	0.098	0.500	20.900	21.044	0.144	0.500	On-Line

The 7-Day Drift Test has been passed.

SOLVAY2016_1.3_001708

SOLVAY SODA ASH JOINT VENTURE
UNIT 1 CALCINER INITIAL CERTIFICATION

ANALYZER:	*Stack Flow*	*SERIAL NO:*	05090204E
SPAN:	7827		
MODEL:	OSI OFS-2000		
TYPE:	IR Beam		

ZERO CALIBRATION ERROR							
DAY	*DATE*	*HOUR*	*SPAN*	*REF VALUE*	*CEMS VALUE*	*DIFF*	*ERROR %*
1	11/6/2007	4:20	7827.000	787.200	774.821	12.379	0.16
2	11/7/2007	4:20	7827.000	787.200	774.732	12.468	0.16
3	11/8/2007	4:20	7827.000	787.200	774.999	12.201	0.16
4	11/9/2007	4:20	7827.000	787.200	774.490	12.710	0.16
5	11/10/2007	4:20	7827.000	787.200	774.375	12.825	0.16
6	11/11/2007	4:20	7827.000	787.200	774.297	12.903	0.16
7	11/12/2007	4:20	7827.000	787.200	774.767	12.433	0.16
						LIMIT	*3.0% OF SPAN*
						HIGH	**0.16%**

SPAN CALIBRATION ERROR							
DAY	*DATE*	*HOUR*	*SPAN*	*REF VALUE*	*CEMS VALUE*	*DIFF*	*ERROR %*
1	11/6/2007	4:20	7827.000	4723.200	4695.139	28.061	0.36
2	11/7/2007	4:20	7827.000	4723.200	4695.080	28.120	0.36
3	11/8/2007	4:20	7827.000	4723.200	4695.317	27.883	0.36
4	11/9/2007	4:20	7827.000	4723.200	4694.834	28.366	0.36
5	11/10/2007	4:20	7827.000	4723.200	4694.753	28.447	0.36
6	11/11/2007	4:20	7827.000	4723.200	4694.625	28.575	0.37
7	11/12/2007	4:20	7827.000	4723.200	4695.043	28.157	0.36
						LIMIT	*3.0% OF SPAN*
						HIGH	**0.37%**

CALCULATIONS: ERROR = |R - A| / S

WHERE: R = REFERENCE VALUE (CALIBRATION GAS)
A = ACTUAL CEMS RESPONSE
S = ANALYZER SPAN

SOLVAY SODA ASH JOINT VENTURE

7-Day Drift Test

CA-1 Stack Velocity ft/min

Time	Instrument Span	Zero Reference	Zero Measured	Zero Drift	Zero Drift Limit	Span Reference	Span Measured	Span Drift	Span Drift Limit	Status
11/06/06 04:20 AM	7872	787.200	774.821	-12.379	236.160	4723.200	4695.139	-28.061	236.160	On-Line
11/07/06 04:20 AM	7872	787.200	774.732	-12.468	236.160	4723.200	4695.080	-28.120	236.160	On-Line
11/08/06 04:20 AM	7872	787.200	774.999	-12.201	236.160	4723.200	4695.317	-27.883	236.160	On-Line
11/09/06 04:20 AM	7872	787.200	774.490	-12.710	236.160	4723.200	4694.834	-28.366	236.160	On-Line
11/10/06 04:20 AM	7872	787.200	774.375	-12.825	236.160	4723.200	4694.753	-28.447	236.160	On-Line
11/11/06 04:20 AM	7872	787.200	774.297	-12.903	236.160	4723.200	4694.625	-28.575	236.160	On-Line
11/12/06 04:20 AM	7872	787.200	774.767	-12.433	236.160	4723.200	4695.043	-28.157	236.160	On-Line

The 7-Day Drift Test has been passed.

APPENDIX 3

LINEARITY CHECK DOCUMENTATION

SOLVAY SODA ASH JOINT VENTURE
UNIT 1 CALCINER NOX LINEARITY

Test Information

Test Date:	**12/6/2006**
Facility:	Solvay Soda Ash
Unit:	Calciner 1
Test Reason:	Initial Certification
Aborted:	No

Analyzer Information

Range:	High
Instrument Span:	400
Manufacturer:	California Analytical Instruments
Model:	650
Serial Number:	S07050

Low Gas Cylinder Number: CC-199275

Run No.	TIME	Reference Gas	CEMS Response	d_i
1	9:37 AM	101.00	99.58	1.42
2	9:44 AM	101.00	101.35	-0.35
3	9:50 AM	101.00	101.35	-0.35

n	3
avg /d/	0.24
avg /RM/	101.00
avg /CEM/	100.76
Linearity Error	0.2
LIMIT	5.0%

Mid Gas Cylinder Number: CC-72634

Run No.	TIME	Reference Gas	CEMS Response	d_i
1	9:39 AM	215.00	214.65	0.35
2	9:46 AM	215.00	215.58	-0.58
3	9:53 AM	215.00	215.83	-0.83

n	3
avg /d/	0.35
avg /RM/	215.00
avg /CEM/	215.35
Linearity Error	0.2
LIMIT	5.0%

High Gas Cylinder Number: SA-20229

Run No.	TIME	Reference Gas	CEMS Response	d_i
1	9:41 AM	362.00	361.93	0.07
2	9:48 AM	362.00	363.70	-1.70
3	9:55 AM	362.00	363.45	-1.45

n	3
avg /d/	1.03
avg /RM/	362.00
avg /CEM/	363.03
Linearity Error	0.3
LIMIT	5.0%

Linearity Error (LE) Determination: $LE = (|R-A| / R) * 100$

R = Reference gas value

A = Mean of actual CEMS responses

NOx Lin

Audit Data

SOLVAY SODA ASH JOINT VENTURE

Data for 12/6/2006 9:34:20 AM thru 12/6/2006 9:57:40 AM from '2006-12-06 09.34.cea'

Timestamp	(CA-1) NOx ppm	(CA-1) O2%	(CA-1) Stack Flow kdscf/hr
9:34:20 AM	94.31	11.99	4325.51
9:34:30 AM	93.11	12.09	4331.12
9:34:40 AM	92.19	12.13	4331.12
9:34:50 AM	91.12	12.31	4326.21
9:35:00 AM	91.24	12.16	4331.81
9:35:10 AM	91.89	12.13	4331.42
9:35:20 AM	92.96	12.06	4326.21
9:35:30 AM	94.06	12.03	4332.50
9:35:40 AM	94.40	12.30	4326.90
9:35:50 AM	94.53	12.29	4326.51
9:36:00 AM	93.98	12.51	4327.59
9:36:10 AM	77.23	15.05	4327.59
9:36:20 AM	82.33	0.65	4327.20
9:36:30 AM	97.20	0.16	4332.81
9:36:40 AM	98.83	0.13	4327.59
9:36:50 AM	99.48	0.12	4327.20
LI 9:37:00 AM	99.58	0.11	4332.81
9:37:10 AM	99.48	0.12	4327.20
9:37:20 AM	99.63	0.12	4327.20
9:37:30 AM	99.35	0.10	4333.20
9:37:40 AM	99.45	0.09	4328.28
9:37:50 AM	99.33	0.10	4328.28
9:38:00 AM	99.45	0.10	4333.89
9:38:10 AM	109.15	0.81	4327.89
9:38:20 AM	185.18	0.13	4327.89
9:38:30 AM	198.93	0.10	4333.50
9:38:40 AM	208.75	0.10	4327.89
9:38:50 AM	214.23	0.11	4328.59
9:39:00 AM	214.50	0.10	4334.59
9:39:10 AM	214.13	0.10	4334.19
MI 9:39:20 AM	214.65	0.10	4328.98
9:39:30 AM	214.50	0.09	4334.19
9:39:40 AM	214.35	0.08	4334.19
9:39:50 AM	214.48	0.10	4328.59
9:40:00 AM	214.65	0.09	4335.28
9:40:10 AM	214.48	0.08	4335.28
9:40:20 AM	214.65	0.10	4329.97
9:40:30 AM	214.50	0.09	4335.97
9:40:40 AM	214.63	0.09	4335.97
9:40:50 AM	223.08	0.10	4329.97
9:41:00 AM	206.58	0.10	4336.27
9:41:10 AM	290.90	0.09	4336.67
HI 9:41:20 AM	361.93	0.05	4330.66
9:41:30 AM	363.83	0.10	4336.27
9:41:40 AM	363.70	0.08	4336.27
9:41:50 AM	363.98	0.07	4330.66
9:42:00 AM	363.43	0.09	4336.67

Timestamp	(CA-1) NOx ppm	(CA-1) O2%	(CA-1) Stack Flow kdscf/hr	
9:42:10 AM	363.58	0.09	4336.67	
9:42:20 AM	363.83	0.07	4336.67	
9:42:30 AM	363.55	0.08	4336.67	
9:42:40 AM	363.58	0.07	4336.67	
9:42:50 AM	363.83	0.07	4336.67	
9:43:00 AM	363.70	0.08	4336.27	
9:43:10 AM	363.98	0.08	4336.27	
9:43:20 AM	363.85	0.07	4336.67	
9:43:30 AM	363.55	0.07	4336.67	
9:43:40 AM	363.45	0.09	4336.97	
9:43:50 AM	343.60	0.08	4336.97	
9:44:00 AM	132.45	0.07	4336.97	
9:44:10 AM	100.00	0.08	4336.97	
9:44:20 AM	100.15	0.08	4336.97	
L2 9:44:30 AM	101.35	0.06	4337.36	
9:44:40 AM	101.10	0.07	4337.36	
9:44:50 AM	101.20	0.06	4335.80	
9:45:00 AM	100.83	0.08	4336.12	
9:45:10 AM	100.55	0.06	4336.12	
9:45:20 AM	100.83	0.08	4336.12	
9:45:30 AM	100.53	0.07	4336.12	
9:45:40 AM	116.10	0.08	4336.50	
9:45:50 AM	196.28	0.09	4336.12	
9:46:00 AM	204.05	0.09	4336.81	
9:46:10 AM	210.48	0.08	4336.81	
9:46:20 AM	215.05	0.09	4336.81	
M2 9:46:30 AM	215.58	0.07	4336.81	
9:46:40 AM	215.55	0.05	4337.19	
9:46:50 AM	215.30	0.07	4336.81	
9:47:00 AM	215.33	0.06	4336.81	
9:47:10 AM	215.55	0.06	4336.81	
9:47:20 AM	215.43	0.07	4336.81	
9:47:30 AM	215.58	0.06	4336.81	
9:47:40 AM	215.55	0.06	4336.81	
9:47:50 AM	299.48	0.08	4336.81	
9:48:00 AM	359.80	0.07	4336.81	
9:48:10 AM	362.88	0.05	4336.81	
9:48:20 AM	362.50	0.06	4336.81	
9:48:30 AM	363.03	0.07	4336.81	
9:48:40 AM	363.18	0.06	4336.81	
H2 9:48:50 AM	363.70	0.06	4336.81	
9:49:00 AM	363.55	0.06	4337.19	
9:49:10 AM	363.28	0.07	4336.81	
9:49:20 AM	363.55	0.07	4335.26	
9:49:30 AM	363.70	0.07	4335.63	
9:49:40 AM	363.55	0.04	4335.26	
9:49:50 AM	325.65	0.06	4335.26	
9:50:00 AM	123.48	0.07	4335.26	
9:50:10 AM	101.75	0.05	4335.26	
9:50:20 AM	101.20	0.05	4335.26	
L3 9:50:30 AM	101.35	0.07	4335.26	

Timestamp	(CA-1) NOx ppm	(CA-1) O2%	(CA-1) Stack Flow kdscf/hr
9:50:40 AM	101.20	0.06	4335.26
9:50:50 AM	100.95	0.04	4335.26
9:51:00 AM	100.68	0.07	4335.26
9:51:10 AM	100.70	0.05	4335.26
9:51:20 AM	100.53	0.05	4335.26
9:51:30 AM	100.55	0.06	4335.26
9:51:40 AM	100.55	0.03	4333.70
9:51:50 AM	100.43	0.06	4333.70
9:52:00 AM	100.15	0.04	4333.70
9:52:10 AM	98.53	0.06	4333.70
9:52:20 AM	97.88	0.07	4333.70
9:52:30 AM	129.65	0.09	4333.70
9:52:40 AM	202.80	0.06	4333.70
9:52:50 AM	207.53	0.06	4333.01
9:53:00 AM	213.15	0.06	4333.70
9:53:10 AM	215.05	0.05	4333.01
9:53:20 AM	215.18	0.05	4333.01
9:53:30 AM	215.30	0.05	4333.01
9:53:40 AM	215.70	0.06	4333.70
M3 9:53:50 AM	215.83	0.07	4333.01
9:54:00 AM	215.05	0.04	4333.01
9:54:10 AM	214.50	0.06	4333.01
9:54:20 AM	210.88	0.10	4332.31
9:54:30 AM	299.48	0.07	4330.76
9:54:40 AM	359.53	0.03	4330.76
9:54:50 AM	362.63	0.07	4330.76
9:55:00 AM	362.35	0.05	4330.76
9:55:10 AM	363.43	0.05	4330.76
H3 9:55:20 AM	363.45	0.07	4330.76
9:55:30 AM	363.43	0.06	4330.76
9:55:40 AM	363.30	0.04	4330.76
9:55:50 AM	363.43	0.05	4330.76
9:56:00 AM	311.70	3.32	4330.76
9:56:10 AM	33.13	5.00	4330.07
9:56:20 AM	27.35	10.32	4330.76
9:56:30 AM	105.10	12.48	4330.76
9:56:40 AM	113.03	12.30	4330.76
9:56:50 AM	113.55	12.27	4330.07
9:57:00 AM	115.85	12.16	4330.76
9:57:10 AM	115.43	12.21	4324.46
9:57:20 AM	115.30	12.32	4330.07
9:57:30 AM	114.23	12.47	4330.07
9:57:40 AM	112.35	12.44	4330.07
Average	204.04	1.96	4333.34
Minimum	27.35	0.03	4324.46
Maximum	363.98	15.05	4337.36

SOLVAY SODA ASH JOINT VENTURE
UNIT 1 CALCINER O2 LINEARITY

Test Information

Test Date:	**12/6/2006**
Facility:	Solvay Soda Ash
Unit:	Calciner 1
Test Reason:	Initial Certification
Aborted:	No

Analyzer Information

Range:	High
Instrument Span:	25
Manufacturer:	California Analytical Instruments
Model:	650
Serial Number:	S07050

Low Gas Cylinder Number: CC-108104

Run No.	TIME	Reference Gas	CEMS Response	d_i
1	10:01 AM	4.99	5.12	-0.13
2	10:08 AM	4.99	5.17	-0.18
3	10:13 AM	4.99	5.20	-0.21

n	3
avg /d/	0.17
avg /RM/	4.99
avg /CEM/	5.16
Linearity Error	3.5
LIMIT	5.0%

Mid Gas Cylinder Number: SA-19771

Run No.	TIME	Reference Gas	CEMS Response	d_i
1	10:02 AM	10.03	10.22	-0.19
2	10:10 AM	10.03	10.26	-0.23
3	10:16 AM	10.03	10.26	-0.23

n	3
avg /d/	0.22
avg /RM/	10.03
avg /CEM/	10.25
Linearity Error	2.2
LIMIT	5.0%

High Gas Cylinder Number: INSTR. AIR

Run No.	TIME	Reference Gas	CEMS Response	d_i
1	10:04 AM	20.90	21.31	-0.41
2	10:12 AM	20.90	21.33	-0.43
3	2:06 PM	20.90	21.34	-0.44

n	3
avg /d/	0.43
avg /RM/	20.90
avg /CEM/	21.33
Linearity Error	2.0
LIMIT	5.0%

Linearity Error (LE) Determination: $LE = (|R-A| / R) * 100$

R = Reference gas value

A = Mean of actual CEMS responses

O_2 Lin

Audit Data

SOLVAY SODA ASH JOINT VENTURE

Data for 12/6/2006 9:59:10 AM thru 12/6/2006 10:21:00 AM from '2006-12-06 09.59.cea'

Timestamp	(CA-1) NOx ppm	(CA-1) O2%	(CA-1) Stack Flow kdscf/hr
9:59:10 AM	108.20	12.36	4324.46
9:59:20 AM	112.23	12.24	4329.37
9:59:30 AM	113.43	12.27	4329.37
9:59:40 AM	113.43	12.28	4323.77
9:59:50 AM	112.75	12.30	4329.37
10:00:00 AM	111.70	12.47	4323.77
10:00:10 AM	110.50	12.47	4323.77
10:00:20 AM	106.33	12.56	4329.37
10:00:30 AM	105.13	12.41	4329.37
10:00:40 AM	57.53	5.72	4323.08
10:00:50 AM	4.98	5.15	4328.68
10:01:00 AM	2.18	5.13	4323.08
10:01:10 AM	1.90	5.12	4323.08
10:01:20 AM	1.48	5.14	4328.68
10:01:30 AM	1.20	5.12	4328.68
10:01:40 AM	1.38	5.11	4323.08
10:01:50 AM	1.20	5.12	4328.68
10:02:00 AM	0.83	5.12	4328.29
10:02:10 AM	3.65	8.80	4322.39
10:02:20 AM	1.88	10.13	4327.99
10:02:30 AM	0.80	10.19	4323.94
10:02:40 AM	0.80	10.22	4329.54
10:02:50 AM	0.95	10.21	4329.54
10:03:00 AM	0.70	10.23	4329.54
10:03:10 AM	0.68	10.21	4329.54
10:03:20 AM	0.80	10.25	4329.54
10:03:30 AM	0.68	14.20	4328.77
10:03:40 AM	0.55	21.05	4327.99
10:03:50 AM	0.70	21.23	4327.99
10:04:00 AM	0.68	21.29	4327.99
10:04:10 AM	0.40	21.29	4327.99
10:04:20 AM	0.55	21.29	4327.99
10:04:30 AM	0.55	21.30	4322.39
10:04:40 AM	0.43	21.31	4322.00
10:04:50 AM	0.40	21.30	4327.99
10:05:00 AM	0.55	21.32	4322.39
10:05:10 AM	0.40	21.33	4327.99
10:05:20 AM	0.40	21.32	4322.39
10:05:30 AM	0.55	21.30	4322.39
10:05:40 AM	0.40	21.32	4326.43
10:05:50 AM	0.28	21.32	4320.46
10:06:00 AM	0.43	21.33	4320.46
10:06:10 AM	0.28	21.32	4320.84
10:06:20 AM	0.25	21.35	4320.46
10:06:30 AM	0.40	21.33	4320.46
10:06:40 AM	0.30	21.35	4319.77
10:06:50 AM	0.43	10.00	4325.37

L1

M2

H1

Timestamp	(CA-1) NOx ppm	(CA-1) O2%	(CA-1) Stack Flow kdscf/hr
10:07:00 AM	0.40	5.36	4319.77
10:07:10 AM	0.40	5.21	4319.77
10:07:20 AM	0.28	5.18	4319.77
10:07:30 AM	0.30	5.18	4320.15
10:07:40 AM	0.30	5.16	4319.77
10:07:50 AM	0.15	5.15	4320.15
10:08:00 AM	0.15	5.16	4319.77
10:08:10 AM	0.28	5.17	4319.77
10:08:20 AM	0.15	5.16	4321.70
10:08:30 AM	0.15	5.14	4321.70
10:08:40 AM	0.28	5.16	4321.70
10:08:50 AM	0.25	5.15	4321.01
10:09:00 AM	0.15	5.13	4320.62
10:09:10 AM	0.15	5.16	4321.01
10:09:20 AM	0.15	5.15	4321.01
10:09:30 AM	0.15	9.14	4321.01
10:09:40 AM	0.13	10.15	4321.01
10:09:50 AM	0.15	10.21	4321.70
10:10:00 AM	0.03	10.23	4320.62
10:10:10 AM	0.15	10.25	4321.01
10:10:20 AM	0.15	10.24	4326.60
10:10:30 AM	0.13	10.26	4321.01
10:10:40 AM	0.15	10.26	4321.01
10:10:50 AM	0.15	10.26	4320.62
10:11:00 AM	0.13	10.28	4321.01
10:11:10 AM	0.00	20.46	4326.21
10:11:20 AM	0.18	21.26	4321.70
10:11:30 AM	0.03	21.30	4321.70
10:11:40 AM	0.03	21.30	4326.90
10:11:50 AM	-0.03	21.30	4319.77
10:12:00 AM	0.15	21.33	4319.77
10:12:10 AM	0.03	21.33	4325.74
10:12:20 AM	0.03	21.33	4324.67
10:12:30 AM	0.03	20.92	4319.46
10:12:40 AM	0.13	5.98	4325.74
10:12:50 AM	0.00	5.23	4325.37
10:13:00 AM	0.00	5.19	4319.77
10:13:10 AM	0.00	5.20	4325.37
10:13:20 AM	0.00	5.17	4325.74
10:13:30 AM	0.00	5.16	4319.77
10:13:40 AM	0.00	5.16	4325.37
10:13:50 AM	0.03	5.17	4325.37
10:14:00 AM	0.00	5.15	4319.77
10:14:10 AM	0.03	5.15	4325.37
10:14:20 AM	0.00	5.18	4325.37
10:14:30 AM	0.03	5.13	4319.77
10:14:40 AM	0.03	5.16	4325.37
10:14:50 AM	0.03	5.16	4325.37
10:15:00 AM	0.00	5.16	4319.77
10:15:10 AM	0.13	8.09	4325.74
10:15:20 AM	0.15	10.15	4325.37

Timestamp	(CA-1) NOx ppm	(CA-1) O2%	(CA-1) Stack Flow kdscf/hr
10:15:30 AM	0.00	10.22	4319.77
10:15:40 AM	-0.13	10.25	4325.37
10:15:50 AM	0.00	10.26	4325.37
10:16:00 AM	0.03	10.26	4325.37
M3 10:16:10 AM	-0.13	10.26	4325.74
10:16:20 AM	-0.10	10.25	4325.37
10:16:30 AM	0.00	10.25	4324.20
10:16:40 AM	0.03	10.28	4324.20
10:16:50 AM	-0.13	10.28	4324.20
10:17:00 AM	-0.03	10.27	4324.20
10:17:10 AM	0.03	10.25	4324.20
10:17:20 AM	-0.10	10.26	4324.20
10:17:30 AM	-0.13	10.27	4324.20
10:17:40 AM	0.03	10.26	4324.20
10:17:50 AM	-0.13	11.08	4324.20
10:18:00 AM	-0.13	20.86	4318.61
10:18:10 AM	-0.13	21.25	4324.20
10:18:20 AM	-0.15	21.30	4324.20
10:18:30 AM	-0.13	21.30	4318.61
10:18:40 AM	-0.13	21.30	4324.20
10:18:50 AM	-0.13	21.31	4324.20
H3 10:19:00 AM	-0.13	21.34	4324.20
10:19:10 AM	-0.10	21.30	4324.20
10:19:20 AM	-0.13	21.36	4324.20
10:19:30 AM	-0.13	21.34	4318.61
10:19:40 AM	-0.13	21.35	4324.20
10:19:50 AM	0.00	21.30	4324.20
10:20:00 AM	58.18	12.96	4318.61
10:20:10 AM	103.50	12.46	4324.20
10:20:20 AM	105.80	12.40	4324.20
10:20:30 AM	107.00	12.35	4318.61
10:20:40 AM	107.65	12.40	4324.20
10:20:50 AM	105.93	12.53	4324.20
10:21:00 AM	105.80	12.47	4319.30
Average	13.51	12.35	4323.76
Minimum	-0.15	5.11	4318.61
Maximum	113.43	21.36	4329.54

APPENDIX 4

DAHS VERIFICATION DOCUMENTATION

Formula Verification Examples

Unit Name: SOLVAY SODA ASH JOINT VENTURE
Date/ Time: 12/06/06 HOUR 1000 Unit /Stack # UNIT 1 CALCINER

Formula F-5
Parameter NOX lb/mmBtu for gas

Fd scf/mmbtu	K (lb/dscf)/ ppm CO	NOX ppmv	O2 dry %	NOX lb/mmBtu
9780	1.194E-07	99.3	12.1	0.275

Heat Input (mmBtu) 186.3

Parameter NOx lb/hr gas

NOx lb/mmBtu	Heat input mmBtu/hr	NOx lb/hr
0.275	186.1	51.3

Parameter NOx ppm@3% O2

NOx ppm	O2 dry %	NOx ppm corr
99.3	12.1	201.99

SOLVAY SODA ASH JOINT VENTURE

GREEN RIVER, WY

CA-1 Daily Emissions & Operations Report

December 6, 2006

Hour	O2%	NOx ppm	NOx ppm @3% O2	NOx lb/mmBtu	NOx lbs	Stack Flow kdscf	Heat Input mmBtu	Stack Pressure inches H2O	Stack Temp °F	Process Status
00	12.8	80.4	177.67	0.242	39.0	4061	160.9	-5.317	332.0	Normal
01	12.4	78.3	164.89	0.224	38.3	4092	170.2	-5.786	355.3	Normal
02	12.5	76.3	162.59	0.221	36.6	4017	165.1	-5.751	395.2	Normal
03	12.4	95.8	201.74	0.274	47.7	4167	173.3	-5.701	396.3	Normal
04	12.1	97.4	198.12	0.270	50.0	4303	185.3	-5.771	382.9	Normal
05	12.3	85.6	178.17	0.242	43.3	4242	178.5	-5.761	393.2	Normal
06	12.3	84.1	175.05	0.238	42.7	4253	178.9	-5.738	392.3	Normal
07	12.1	87.6	178.19	0.242	45.3	4330	186.4	-5.881	381.1	Normal
08	12.1	90.1	183.27	0.249	46.5	4320	186.0	-5.972	385.2	Normal
09	12.1	87.4	177.78	0.242	45.1	4323	186.1	-5.906	385.3	Normal
10	12.1	99.3	201.99	0.275	51.3	4326	186.3	-5.875	385.0	Normal
11	12.2	96.8	199.16	0.271	49.9	4318	183.8	-5.989	389.1	Normal
12	12.2	95.5	196.49	0.267	49.8	4366	185.8	-5.915	383.8	Normal
13	12.1	93.8	190.80	0.260	49.0	4373	188.2	-5.792	381.7	Normal
14	12.0	87.5	175.98	0.239	45.6	4361	189.9	-5.920	379.9	Normal
15	12.2	89.9	184.97	0.252	46.5	4334	184.5	-5.912	380.8	Normal
16	12.3	88.0	183.16	0.249	44.9	4273	179.8	-5.877	391.7	Normal
17	12.2	96.6	198.75	0.270	49.0	4249	180.8	-5.931	401.2	Normal
18	12.2	98.8	203.28	0.277	50.5	4283	182.3	-5.870	399.4	Normal
19	12.1	95.4	194.05	0.264	49.1	4312	185.6	-5.890	395.4	Normal
20	12.1	95.1	193.44	0.263	49.1	4321	186.0	-5.851	393.3	Normal
21	12.1	78.2	159.07	0.216	39.7	4257	183.3	-5.907	402.6	Normal
22	12.2	80.8	166.24	0.226	40.6	4213	179.3	-5.895	413.0	Normal
23	12.1	78.4	159.47	0.217	39.6	4233	182.3	-5.926	412.7	Normal
Average Total	12.2	89.0	183.5	0.250	1089.1	102327	4349	-5.839	387.9	

SOLVAY2016_1.3_001722

APPENDIX 5

GAS CYLINDER CERTIFICATES

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER US WELDING - ROCKSPRINGS **P.O NUMBER**

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
NITRIC OXIDE GMIS	SRM#1686b	SA 11830	505 ppm

ANALYZER READINGS

R=REFERENCE STANDARD *Z=ZERO GAS* *C=GAS CANDIDATE*

1. **COMPONENT** NITRIC OXIDE GMIS **ANALYZER MAKE-MODEL-S/N** BECKMAN 951A S/N#0101354
   ANALYTICAL PRINCIPLE CHEMILUMINESCENCE **LAST CALIBRATION DATE** 01/03/06
   FIRST ANALYSIS DATE 01/04/06 **SECOND ANALYSIS DATE** 01/11/06

Z 0.0	R 541.4	C 386.8	CONC. 360.8		Z 0.0	R 506.6	C 359.6	CONC. 358.5	
R 544.2	Z 0.0	C 387.8	CONC. 359.9		R 507.3	Z 0.0	C 359.5	CONC. 357.9	
Z 0.0	C 388.4	R 544.6	CONC. 360.2		Z 0.0	C 359.8	R 507.5	CONC. 358.0	
U/M mV		MEAN TEST ASSAY	360.3 ppm		U/M mV		MEAN TEST ASSAY	358.1 ppm	

NOx value for reference only. Values not valid below 150 psig.

THIS CYLINDER NO. SA 20229
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121
OF TRACEABILITY PROTOCOL NO. Rev. 9/97
PROCEDURE G1
CERTIFIED ACCURACY ± 1 **% NIST TRACEABLE**
CYLINDER PRESSURE 2000 **PSIG**
CERTIFICATION DATE 01/11/06
EXPIRATION DATE 01/11/08 **TERM** 24 MONTHS

CERTIFIED CONCENTRATION

NITRIC OXIDE	359 ppm
NITROGEN	BALANCE
NOx	362 ppm

ANALYZED BY CHRIS VU ***CERTIFIED BY*** VICTOR DOTAN

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER US WELDING **P.O NUMBER** 4904481

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
NITRIC OXIDE GMIS	vs.SRM#1684	CC 144832	93.6 ppm

ANALYZER READINGS

R=REFERENCE STANDARD *Z=ZERO GAS* *C=GAS CANDIDATE*

1. **COMPONENT** NITRIC OXIDE GMIS **ANALYZER MAKE-MODEL-S/N** BECKMAN 951A S/N#0101354
ANALYTICAL PRINCIPLE CHEMILUMINESCENCE **LAST CALIBRATION DATE** 08/07/06
FIRST ANALYSIS DATE 08/29/06 **SECOND ANALYSIS DATE** 09/06/06

Z 0.0	R 844.0	C 885.0	CONC. 98.1	Z 0.0	R 800.0	C 834.0	CONC. 97.6
R 845.0	Z 0.0	C 886.0	CONC. 98.1	R 800.0	Z 0.0	C 837.0	CONC. 97.9
Z 0.0	C 888.0	R 844.0	CONC. 98.5	Z 0.0	C 837.0	R 801.0	CONC. 97.8
U/M mV		MEAN TEST ASSAY 98.2		U/M mV		MEAN TEST ASSAY 97.8	

VALUE NOT VALID BELOW 150 PSIG.
NOX VALUE FOR REFERENCE USE ONLY.

THIS CYLINDER NO. CC 199275
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121
OF TRACEABILITY PROTOCOL NO. Rev. 9/97
PROCEDURE G1
CERTIFIED ACCURACY ± 1 **% NIST TRACEABLE**
CYLINDER PRESSURE 2000 **PSIG**
CERTIFICATION DATE 09/06/06
EXPIRATION DATE 09/06/08 **TERM** 24 MONTHS

CERTIFIED CONCENTRATION

NITRIC OXIDE	98.0 ppm
NITROGEN	BALANCE
NOx	101 ppm

ANALYZED BY VICTOR DOTAN ***CERTIFIED BY*** GEORGE WAHBA

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER US WELDING **P.O NUMBER** 4904481

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
NITRIC OXIDE GMIS	vs.SRM#1685	CC 172035	258.2 ppm

ANALYZER READINGS

R=REFERENCE STANDARD *Z=ZERO GAS* *C=GAS CANDIDATE*

1. **COMPONENT** NITRIC OXIDE GMIS **ANALYZER MAKE-MODEL-S/N** BECKMAN 951A S/N#0101354
ANALYTICAL PRINCIPLE CHEMILUMINESCENCE **LAST CALIBRATION DATE** 08/07/06
FIRST ANALYSIS DATE 08/29/06 **SECOND ANALYSIS DATE** 09/06/06

Z 0	R 897	C 738	CONC. 212		Z 0	R 890	C 726	CONC. 211			
R 898	Z 0	C 739	CONC. 212		R 888	Z 0	C 725	CONC. 211			
Z 0	C 740	R 898	CONC. 213		Z 0	C 726	R 889	CONC. 211			
U/M mV		MEAN TEST ASSAY 212			U/M mV			MEAN TEST ASSAY 211			

VALUE NOT VALID BELOW 150 PSIG.
NOX VALUE FOR REFERENCE USE ONLY.

THIS CYLINDER NO. CC 72634
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/297/121
OF TRACEABILITY PROTOCOL NO. Rev. 9/97
PROCEDURE G1
CERTIFIED ACCURACY ± 1 **% NIST TRACEABLE**
CYLINDER PRESSURE 2000 **PSIG**
CERTIFICATION DATE 09/06/06
EXPIRATION DATE 09/06/08 **TERM** 24 MONTHS

CERTIFIED CONCENTRATION

NITRIC OXIDE	212 ppm
NITROGEN	BALANCE
NOx	215 ppm

ANALYZED BY VICTOR DOTAN ***CERTIFIED BY*** GEORGE WAHBA

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER US WELDING **P.O NUMBER** 4904481

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
OXYGEN GMIS	vs.SRM#2658	CC 95880	5.01 %

ANALYZER READINGS

R=REFERENCE STANDARD *Z=ZERO GAS* *C=GAS CANDIDATE*

1. **COMPONENT** OXYGEN GMIS **ANALYZER MAKE/MODEL-S/N** Siemens Oxymat 5E S/N A12-839

ANALYTICAL PRINCIPLE Paramagnetic **LAST CALIBRATION DATE** 08/03/06

FIRST ANALYSIS DATE 08/24/06 **SECOND ANALYSIS DATE**

Z 0.00	R 5.01	C 4.99	CONC. 4.99		Z	R	C	CONC.	
R 5.01	Z 0.00	C 4.99	CONC. 4.99		R	Z	C	CONC.	
Z 0.00	C 4.99	R 5.01	CONC. 4.99		Z	C	R	CONC.	
U/M %		MEAN TEST ASSAY 4.99		U/M %			MEAN TEST ASSAY		

Value not valid below 150 psig

THIS CYLINDER NO. CC 108104
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121
OF TRACEABILITY PROTOCOL NO. Rev. 9/97
PROCEDURE G1
CERTIFIED ACCURACY ± 1 % NIST TRACEABLE
CYLINDER PRESSURE 2000 PSIG
CERTIFICATION DATE 08/24/06
EXPIRATION DATE 08/24/09 **TERM** 36 MONTHS

CERTIFIED CONCENTRATION

OXYGEN	4.99 %
NITROGEN	BALANCE

ANALYZED BY KING CHEUNG ***CERTIFIED BY*** HELENA TRAN

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER US WELDING **P.O NUMBER** 4904481

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
OXYGEN GMIS	vs.SRM#2658	CC 74692	9.98 %

ANALYZER READINGS

R=REFERENCE STANDARD *Z=ZERO GAS* *C=GAS CANDIDATE*

1. **COMPONENT** OXYGEN GMIS **ANALYZER MAKE-MODEL-S/N** Siemens Oxymat 5E S/N A12-839

ANALYTICAL PRINCIPLE Paramagnetic **LAST CALIBRATION DATE** 08/03/06

FIRST ANALYSIS DATE 08/24/06 **SECOND ANALYSIS DATE**

Z 0.00	R 9.98	C 10.02	CONC. 10.02	Z	R	C	CONC.	
R 9.98	Z 0.00	C 10.04	CONC. 10.04	R	Z	C	CONC.	
Z 0.00	C 10.04	R 9.98	CONC. 10.04	Z	C	R	CONC.	
U/M %		MEAN TEST ASSAY 10.03		U/M %			MEAN TEST ASSAY	

Value not valid below 150 psig

THIS CYLINDER NO.	SA 19771	**CERTIFIED CONCENTRATION**	
HAS BEEN CERTIFIED ACCORDING TO SECTION	EPA-600/R97/121	OXYGEN	10.03 %
OF TRACEABILITY PROTOCOL NO.	Rev. 9/97	NITROGEN	BALANCE
PROCEDURE	G1		
CERTIFIED ACCURACY	± 1 % NIST TRACEABLE		
CYLINDER PRESSURE	2000 PSIG		
CERTIFICATION DATE	08/24/06		
EXPIRATION DATE	08/24/09 **TERM** 36 MONTHS		

ANALYZED BY KING CHEUNG ***CERTIFIED BY*** HELENA TRAN

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER US WELDING-ROCK SPRINGS **P.O NUMBER**

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
OXYGEN GMIS	vs.SRM#2658	CC 73519	5.01 %

ANALYZER READINGS

R=REFERENCE STANDARD *Z=ZERO GAS* *C=GAS CANDIDATE*

1. **COMPONENT** OXYGEN GMIS **ANALYZER MAKE-MODEL-S/N** Siemens Oxymat 5E S/N A12-839

ANALYTICAL PRINCIPLE Paramagnetic **LAST CALIBRATION DATE** 01/03/06

FIRST ANALYSIS DATE 01/03/06 **SECOND ANALYSIS DATE**

Z 0.00	R 5.01	C 2.53	CONC. 2.53	Z	R	C	CONC.
R 5.01	Z 0.00	C 2.53	CONC. 2.53	R	Z	C	CONC.
Z 0.00	C 2.53	R 5.01	CONC. 2.53	Z	C	R	CONC.
U/M %		MEAN TEST ASSAY	2.53	U/M %		MEAN TEST ASSAY	

VALUES NOT VALID BELOW 150 PSIG.

THIS CYLINDER NO. CC 130268
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121
OF TRACEABILITY PROTOCOL NO. REV 9/97
PROCEDURE G1
CERTIFIED ACCURACY ± 1 **% NIST TRACEABLE**
CYLINDER PRESSURE 2000 **PSIG**
CERTIFICATION DATE 01/03/06
EXPIRATION DATE 01/03/09 **TERM** 36 MONTHS

CERTIFIED CONCENTRATION

OXYGEN	2.53 %
NITROGEN	BALANCE

ANALYZED BY ISMAEL RANGSIYAWONG ***CERTIFIED BY*** HELENA TRAN